

SEQUENCE LISTING

(1) GENERAL INFORMATION

- (i) APPLICANT: Svendsen, Allan
Xu, Feng
- (ii) TITLE OF THE INVENTION: LACCASE MUTANTS
- (iii) NUMBER OF SEQUENCES: 10
- (iv) CORRESPONDENCE ADDRESS:
 - (A) ADDRESSEE: Novo Nordisk of North America, Inc.
 - (B) STREET: 405 Lexington Avenue
 - (C) CITY: New York
 - (D) STATE: NY
 - (E) COUNTRY: USA
 - (F) ZIP: 10174
- (v) COMPUTER READABLE FORM:
 - (A) MEDIUM TYPE: Diskette
 - (B) COMPUTER: IBM Compatible
 - (C) OPERATING SYSTEM: DOS
 - (D) SOFTWARE: FastSEQ for Windows Version 2.0
- (vi) CURRENT APPLICATION DATA:
 - (A) APPLICATION NUMBER: to be assigned
 - (B) FILING DATE: 15-SEP-1999
 - (C) CLASSIFICATION:
- (viii) ATTORNEY/AGENT INFORMATION:
 - (A) NAME: Green, Reza
 - (B) REGISTRATION NUMBER: 38,475
 - (C) REFERENCE/DOCKET NUMBER: 5200.210-US
- (ix) TELECOMMUNICATION INFORMATION:
 - (A) TELEPHONE: 212-867-0123
 - (B) TELEFAX: 212-878-9655

(2) INFORMATION FOR SEQ ID NO: 1:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 539 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: protein
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

Met	Phe	Lys	Asn	Leu	Leu	Ser	Phe	Ala	Leu	Leu	Ala	Ile	Ser	Val	Ala
1				5					10					15	
Asn	Ala	Gln	Ile	Val	Asn	Ser	Val	Asp	Thr	Met	Thr	Leu	Thr	Asn	Ala
			20					25					30		
Asn	Val	Ser	Pro	Asp	Gly	Phe	Thr	Arg	Ala	Gly	Ile	Leu	Val	Asn	Gly
		35					40					45			
Val	His	Gly	Pro	Leu	Ile	Arg	Gly	Gly	Lys	Asn	Asp	Asn	Phe	Glu	Leu
	50					55					60				
Asn	Val	Val	Asn	Asp	Leu	Asp	Asn	Pro	Thr	Met	Leu	Arg	Pro	Thr	Ser
65					70				75					80	

Ile His Trp His Gly Leu Phe Gln Arg Gly Thr Asn Trp Ala Asp Gly
 85 90 95
 Ala Asp Gly Val Asn Gln Cys Pro Ile Ser Pro Gly His Ala Phe Leu
 100 105 110
 Tyr Lys Phe Thr Pro Ala Gly His Ala Gly Thr Phe Trp Tyr His Ser
 115 120 125
 His Phe Gly Thr Gln Tyr Cys Asp Gly Leu Arg Gly Pro Met Val Ile
 130 135 140
 Tyr Asp Asp Asn Asp Pro His Ala Ala Leu Tyr Asp Glu Asp Asp Glu
 145 150 155 160
 Asn Thr Ile Ile Thr Leu Ala Asp Trp Tyr His Ile Pro Ala Pro Ser
 165 170 175
 Ile Gln Gly Ala Ala Gln Pro Asp Ala Thr Leu Ile Asn Gly Lys Gly
 180 185 190
 Arg Tyr Val Gly Gly Pro Ala Ala Glu Leu Ser Ile Val Asn Val Glu
 195 200 205
 Gln Gly Lys Lys Tyr Arg Met Arg Leu Ile Ser Leu Ser Cys Asp Pro
 210 215 220
 Asn Trp Gln Phe Ser Ile Asp Gly His Glu Leu Thr Ile Ile Glu Val
 225 230 235 240
 Asp Gly Gln Leu Thr Glu Pro His Thr Val Asp Arg Leu Gln Ile Phe
 245 250 255
 Thr Gly Gln Arg Tyr Ser Phe Val Leu Asp Ala Asn Gln Pro Val Asp
 260 265 270
 Asn Tyr Trp Ile Arg Ala Gln Pro Asn Lys Gly Arg Asn Gly Leu Ala
 275 280 285
 Gly Thr Phe Ala Asn Gly Val Asn Ser Ala Ile Leu Arg Tyr Ala Gly
 290 295 300
 Ala Ala Asn Ala Asp Pro Thr Thr Ser Ala Asn Pro Asn Pro Ala Gln
 305 310 315 320
 Leu Asn Glu Ala Asp Leu His Ala Leu Ile Asp Pro Ala Ala Pro Gly
 325 330 335
 Ile Pro Thr Pro Gly Ala Ala Asp Val Asn Leu Arg Phe Gln Leu Gly
 340 345 350
 Phe Ser Gly Gly Arg Phe Thr Ile Asn Gly Thr Ala Tyr Glu Ser Pro
 355 360 365
 Ser Val Pro Thr Leu Leu Gln Ile Met Ser Gly Ala Gln Ser Ala Asn
 370 375 380
 Asp Leu Leu Pro Ala Gly Ser Val Tyr Glu Leu Pro Arg Asn Gln Val
 385 390 395 400
 Val Glu Leu Val Val Pro Ala Gly Val Leu Gly Gly Pro His Pro Phe
 405 410 415
 His Leu His Gly His Ala Phe Ser Val Val Arg Ser Ala Gly Ser Ser
 420 425 430
 Thr Tyr Asn Phe Val Asn Pro Val Lys Arg Asp Val Val Ser Leu Gly
 435 440 445

0022350 120700

Val Thr Gly Asp Glu Val Thr Ile Arg Phe Val Thr Asp Asn Pro Gly
 450 455 460

Pro Trp Phe Phe His Cys His Ile Glu Phe His Leu Met Asn Gly Leu
 465 470 475 480

Ala Ile Val Phe Ala Glu Asp Met Ala Asn Thr Val Asp Ala Asn Asn
 485 490 495

Pro Pro Val Glu Trp Ala Gln Leu Cys Glu Ile Tyr Asp Asp Leu Pro
 500 505 510

Pro Glu Ala Thr Ser Ile Gln Thr Val Val Arg Arg Ala Glu Pro Thr
 515 520 525

Gly Phe Ser Ala Lys Phe Arg Arg Glu Gly Leu
 530 535

(2) INFORMATION FOR SEQ ID NO: 2:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 499 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

Gly Ile Gly Pro Val Ala Asp Leu Thr Ile Thr Asn Ala Ala Val Ser
 1 5 10 15

Pro Asp Gly Phe Ser Arg Gln Ala Val Val Val Asn Gly Gly Thr Pro
 20 25 30

Gly Pro Leu Ile Thr Gly Asn Met Gly Asp Arg Phe Gln Leu Asn Val
 35 40 45

Ile Asp Asn Leu Thr Asn His Thr Met Leu Lys Ser Thr Ser Ile His
 50 55 60

Trp His Gly Phe Phe Gln Lys Gly Thr Asn Trp Ala Asp Gly Pro Ala
 65 70 75 80

Phe Ile Asn Gln Cys Pro Ile Ser Ser Gly His Ser Phe Leu Tyr Asp
 85 90 95

Phe Gln Val Pro Asp Gln Ala Gly Thr Phe Trp Tyr His Ser His Leu
 100 105 110

Ser Thr Gln Tyr Cys Asp Gly Leu Arg Gly Pro Phe Val Val Tyr Asp
 115 120 125

Pro Asn Asp Pro Ala Ala Asp Leu Tyr Asp Val Asp Asn Asp Asp Thr
 130 135 140

Val Ile Thr Leu Val Asp Trp Tyr His Val Ala Ala Lys Leu Gly Pro
 145 150 155 160

Ala Phe Pro Leu Gly Ala Asp Ala Thr Leu Ile Asn Gly Lys Gly Arg
 165 170 175

Ser Pro Ser Thr Thr Ala Asp Leu Ser Val Ile Ser Val Thr Pro
 180 185 190

Gly Lys Arg Tyr Arg Phe Arg Leu Val Ser Leu Ser Cys Asp Pro Asn
 195 200 205
 Tyr Thr Phe Ser Ile Asp Gly His Asn Met Thr Ile Ile Glu Thr Asp
 210 215 220
 Ser Ile Asn Thr Ala Pro Leu Val Val Asp Ser Ile Gln Ile Phe Ala
 225 230 235 240
 Ala Gln Arg Tyr Ser Phe Val Leu Glu Ala Asn Gln Ala Val Asp Asn
 245 250 255
 Tyr Trp Ile Arg Ala Asn Pro Asn Phe Gly Asn Val Gly Phe Thr Gly
 260 265 270
 Gly Ile Asn Ser Ala Ile Leu Arg Tyr Asp Gly Ala Ala Val Glu
 275 280 285
 Pro Thr Thr Thr Gln Thr Thr Ser Thr Ala Pro Leu Asn Glu Val Asn
 290 295 300
 Leu His Pro Leu Val Thr Thr Ala Val Pro Gly Ser Pro Val Ala Gly
 305 310 315 320
 Gly Val Asp Leu Ala Ile Asn Met Ala Phe Asn Phe Asn Gly Thr Asn
 325 330 335
 Phe Phe Ile Asn Gly Ala Ser Phe Thr Pro Pro Thr Val Pro Val Leu
 340 345 350
 Leu Gln Ile Ile Ser Gly Ala Gln Asn Ala Gln Asp Leu Leu Pro Ser
 355 360 365
 Gly Ser Val Tyr Ser Leu Pro Ser Asn Ala Asp Ile Glu Ile Ser Phe
 370 375 380
 Pro Ala Thr Ala Ala Ala Pro Gly Ala Pro His Pro Phe His Leu His
 385 390 395 400
 Gly His Ala Phe Ala Val Val Arg Ser Ala Gly Ser Thr Val Tyr Asn
 405 410 415
 Tyr Asp Asn Pro Ile Phe Arg Asp Val Val Ser Thr Gly Thr Pro Ala
 420 425 430
 Ala Gly Asp Asn Val Thr Ile Arg Phe Arg Thr Asp Asn Pro Gly Pro
 435 440 445
 Trp Phe Leu His Cys His Ile Asp Phe His Leu Glu Ala Gly Phe Ala
 450 455 460
 Val Val Phe Ala Glu Asp Ile Pro Asp Val Ala Ser Ala Asn Pro Val
 465 470 475 480
 Pro Gln Ala Trp Ser Asp Leu Cys Pro Thr Tyr Asp Ala Leu Asp Pro
 485 490 495
 Ser Asp Gln

(2) INFORMATION FOR SEQ ID NO: 3:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 499 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

Ala Ile Gly Pro Val Ala Ser Leu Val Val Ala Asn Ala Pro Val Ser
 1 5 10 15
 Pro Asp Gly Phe Leu Arg Asp Ala Ile Val Val Asn Gly Val Val Pro
 20 25 30
 Ser Pro Leu Ile Thr Gly Lys Lys Gly Asp Arg Phe Gln Leu Asn Val
 35 40 45
 Val Asp Thr Leu Thr Asn His Ser Met Leu Lys Ser Thr Ser Ile His
 50 55 60
 Trp His Gly Phe Phe Gln Ala Gly Thr Asn Trp Ala Glu Gly Pro Ala
 65 70 75 80
 Phe Val Asn Gln Cys Pro Ile Ala Ser Gly His Ser Phe Leu Tyr Asp
 85 90 95
 Phe His Val Pro Asp Gln Ala Gly Thr Phe Trp Tyr His Ser His Leu
 100 105 110
 Ser Thr Gln Tyr Cys Asp Gly Leu Arg Gly Pro Phe Val Val Tyr Asp
 115 120 125
 Pro Lys Asp Pro His Ala Ser Arg Tyr Asp Val Asp Asn Glu Ser Thr
 130 135 140
 Val Ile Thr Leu Thr Asp Trp Tyr His Thr Ala Ala Arg Leu Gly Pro
 145 150 155 160
 Lys Phe Pro Leu Gly Ala Asp Ala Thr Leu Ile Asn Gly Leu Gly Arg
 165 170 175
 Ser Ala Ser Thr Pro Thr Ala Ala Leu Ala Val Ile Asn Val Gln His
 180 185 190
 Gly Lys Arg Tyr Arg Phe Arg Leu Val Ser Ile Ser Cys Asp Pro Asn
 195 200 205
 Tyr Thr Phe Ser Ile Asp Gly His Asn Leu Thr Val Ile Glu Val Asp
 210 215 220
 Gly Ile Asn Ser Gln Pro Leu Leu Val Asp Ser Ile Gln Ile Phe Ala
 225 230 235 240
 Ala Gln Arg Tyr Ser Phe Val Leu Asn Ala Asn Gln Thr Val Gly Asn
 245 250 255
 Tyr Trp Val Arg Ala Asn Pro Asn Phe Gly Thr Val Gly Phe Ala Gly
 260 265 270
 Gly Ile Asn Ser Ala Ile Leu Arg Tyr Gln Gly Ala Pro Val Ala Glu
 275 280 285
 Pro Thr Thr Thr Gln Thr Pro Ser Val Ile Pro Leu Ile Glu Thr Asn
 290 295 300
 Leu His Pro Leu Ala Arg Met Pro Val Pro Gly Ser Pro Thr Pro Gly
 305 310 315 320
 Gly Val Asp Lys Ala Leu Asn Leu Ala Phe Asn Phe Asn Gly Thr Asn
 325 330 335

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Phe Phe Ile Asn Asn Ala Thr Phe Thr Pro Pro Thr Val Pro Val Leu
 340 345 350
 Leu Gln Ile Leu Ser Gly Ala Gln Thr Ala Gln Asp Leu Leu Pro Ala
 355 360 365
 Gly Ser Val Tyr Pro Leu Pro Ala His Ser Thr Ile Glu Ile Thr Leu
 370 375 380
 Pro Ala Thr Ala Leu Ala Pro Gly Ala Pro His Pro Phe His Leu His
 385 390 395 400
 Gly His Ala Phe Ala Val Val Arg Ser Ala Gly Ser Thr Thr Tyr Asn
 405 410 415
 Tyr Asn Asp Pro Ile Phe Arg Asp Val Val Ser Thr Gly Thr Pro Ala
 420 425 430
 Ala Gly Asp Asn Val Thr Ile Arg Phe Gln Thr Asp Asn Pro Gly Pro
 435 440 445
 Trp Phe Leu His Cys His Ile Asp Phe His Leu Asp Ala Gly Phe Ala
 450 455 460
 Ile Val Phe Ala Glu Asp Val Ala Asp Val Lys Ala Ala Asn Pro Val
 465 470 475 480
 Pro Lys Ala Trp Ser Asp Leu Cys Pro Ile Tyr Asp Gly Leu Ser Glu
 485 490 495
 Ala Asn Gln

(2) INFORMATION FOR SEQ ID NO: 4:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 548 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

Met His Thr Phe Leu Arg Ser Thr Ala Leu Val Val Ala Gly Leu Ser
 1 5 10 15
 Ala Arg Ala Leu Ala Ser Ile Gly Pro Val Thr Asp Phe His Ile Val
 20 25 30
 Asn Ala Ala Val Ser Pro Asp Gly Phe Ser Arg Gln Ala Val Leu Ala
 35 40 45
 Glu Gly Val Phe Pro Gly Pro Leu Ile Ala Gly Asn Lys Gly Asp Asn
 50 55 60
 Phe Gln Ile Asn Val Ile Asp Glu Leu Thr Asn Ala Thr Met Leu Lys
 65 70 75 80
 Thr Thr Thr Ile His Trp His Gly Phe Phe Gln His Gly Thr Asn Trp
 85 90 95
 Ala Asp Gly Pro Ala Phe Ile Asn Gln Cys Pro Ile Ala Ser Gly Asp
 100 105 110

Ser Phe Leu Tyr Asn Phe Gln Val Pro Asp Gln Ala Gly Thr Phe Trp
 115 120 125
 Tyr His Ser His Leu Ser Thr Gln Tyr Cys Asp Gly Leu Arg Gly Pro
 130 135 140
 Phe Val Val Tyr Asp Pro Ala Asp Pro Tyr Leu Asp Gln Tyr Asp Val
 145 150 155 160
 Asp Asp Asp Ser Thr Val Ile Thr Leu Ala Asp Trp Tyr His Thr Ala
 165 170 175
 Ala Arg Leu Gly Ser Pro Phe Pro Ala Ala Asp Thr Thr Leu Ile Asn
 180 185 190
 Gly Leu Gly Arg Cys Gly Glu Ala Gly Cys Pro Val Ser Asp Leu Ala
 195 200 205
 Val Ile Ser Val Thr Lys Gly Lys Arg Tyr Arg Phe Arg Leu Val Ser
 210 215 220
 Ile Ser Cys Asp Ser Phe Phe Thr Phe Ser Ile Asp Gly His Ser Leu
 225 230 235 240
 Asn Val Ile Glu Val Asp Ala Thr Asn His Gln Pro Leu Thr Val Asp
 245 250 255
 Glu Leu Thr Ile Tyr Ala Gly Gln Arg Tyr Ser Phe Ile Leu Thr Ala
 260 265 270
 Asp Gln Asp Val Asp Asn Tyr Trp Ile Arg Ala Asn Pro Gly Ile Gly
 275 280 285
 Ile Thr Thr Gly Phe Ala Gly Gly Ile Asn Ser Ala Ile Leu Arg Tyr
 290 295 300
 Asp Gly Ala Asp Val Val Glu Pro Thr Thr Thr Gln Ala Thr Ser Pro
 305 310 315 320
 Val Val Leu Ser Glu Ser Asn Leu Ala Pro Leu Thr Asn Ala Ala Ala
 325 330 335
 Pro Gly Leu Pro Glu Val Gly Gly Val Asp Leu Ala Leu Asn Phe Asn
 340 345 350
 Leu Thr Phe Asp Gly Pro Ser Leu Lys Phe Gln Ile Asn Gly Val Thr
 355 360 365
 Phe Val Pro Pro Thr Val Pro Val Leu Leu Gln Ile Leu Ser Gly Ala
 370 375 380
 Gln Ser Ala Ala Asp Leu Leu Pro Ser Gly Ser Val Tyr Ala Leu Pro
 385 390 395 400
 Ser Asn Ala Thr Ile Glu Leu Ser Leu Pro Ala Gly Ala Leu Gly Gly
 405 410 415
 Pro His Pro Phe His Leu His Gly His Thr Phe Ser Val Val Arg Pro
 420 425 430
 Ala Gly Ser Thr Thr Tyr Asn Tyr Val Asn Pro Val Gln Arg Asp Val
 435 440 445
 Val Ser Ile Gly Asn Thr Gly Asp Asn Val Thr Ile Arg Phe Asp Thr
 450 455 460
 Asn Asn Pro Gly Pro Trp Phe Leu His Cys His Ile Asp Trp His Leu

002031 05555200

(2) INFORMATION FOR SEQ ID NO: 5:

(A) LENGTH: 529 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:

Met 1	Leu	Ser	Ser	Ile 5	Thr	Leu	Leu	Pro	Leu 10	Ala	Ala	Val	Ser 15	Thr	
Pro	Ala	Phe	Ala 20	Ala	Val	Arg	Asn	Tyr 25	Lys	Phe	Asp	Ile	Lys 30	Asn	Val
Asn	Val	Ala 35	Pro	Asp	Gly	Phe	Gln 40	Arg	Ser	Ile	Val	Ser 45	Val	Asn	Gly
Leu	Val 50	Pro	Gly	Thr	Leu	Ile 55	Thr	Ala	Asn	Lys	Gly 60	Asp	Thr	Leu	Arg
Ile 65	Asn	Val	Thr	Asn	Gln 70	Leu	Thr	Asp	Pro	Ser 75	Met	Arg	Arg	Ala	Thr 80
Thr	Ile	His	Trp	His 85	Gly	Leu	Phe	Gln	Ala 90	Thr	Thr	Ala	Asp	Glu 95	Asp
Gly	Pro	Ala	Phe 100	Val	Thr	Gln	Cys	Pro 105	Ile	Ala	Gln	Asn	Leu 110	Ser	Tyr
Thr	Tyr	Glu 115	Ile	Pro	Leu	Arg	Gly 120	Gln	Thr	Gly	Thr	Met 125	Trp	Tyr	His
Ala	His 130	Leu	Ala	Ser	Gln	Tyr 135	Val	Asp	Gly	Leu	Arg 140	Gly	Pro	Leu	Val
Ile 145	Tyr	Asp	Pro	Asn	Asp 150	Pro	His	Lys	Ser	Arg 155	Tyr	Asp	Val	Asp	Asp 160
Ala	Ser	Thr	Val	Val 165	Met	Leu	Glu	Asp	Trp 170	Tyr	His	Thr	Pro	Ala 175	Pro
Val	Leu	Glu 180	Lys	Gln	Met	Phe	Ser	Thr 185	Asn	Asn	Thr	Ala	Leu 190	Leu	Ser

Pro Val Pro Asp Ser Gly Leu Ile Asn Gly Lys Gly Arg Tyr Val Gly
 195 200 205
 Gly Pro Ala Val Pro Arg Ser Val Ile Asn Val Lys Arg Gly Lys Arg
 210 215 220
 Tyr Arg Leu Arg Val Ile Asn Ala Ser Ala Ile Gly Ser Phe Thr Phe
 225 230 235 240
 Ser Ile Glu Gly His Ser Leu Thr Val Ile Glu Ala Asp Gly Ile Leu
 245 250 255
 His Gln Pro Leu Ala Val Asp Ser Phe Gln Ile Tyr Ala Gly Gln Arg
 260 265 270
 Tyr Ser Val Ile Val Glu Ala Asn Gln Thr Ala Ala Asn Tyr Trp Ile
 275 280 285
 Arg Ala Pro Met Thr Val Ala Gly Ala Gly Thr Asn Ala Asn Leu Asp
 290 295 300
 Pro Thr Asn Val Phe Ala Val Leu His Tyr Glu Gly Ala Pro Asn Ala
 305 310 315 320
 Glu Pro Thr Thr Glu Gln Gly Ser Ala Ile Gly Thr Ala Leu Val Glu
 325 330 335
 Glu Asn Leu His Ala Leu Ile Asn Pro Gly Ala Pro Gly Gly Ser Ala
 340 345 350
 Pro Ala Asp Val Ser Leu Asn Leu Ala Ile Gly Arg Ser Thr Val Asp
 355 360 365
 Gly Ile Leu Arg Phe Thr Phe Asn Asn Ile Lys Tyr Glu Ala Pro Ser
 370 375 380
 Leu Pro Thr Leu Leu Lys Ile Leu Ala Asn Asn Ala Ser Asn Asp Ala
 385 390 395 400
 Asp Phe Thr Pro Asn Glu His Thr Ile Val Leu Pro His Asn Lys Val
 405 410 415
 Ile Glu Leu Asn Ile Thr Gly Gly Ala Asp His Pro Ile His Leu His
 420 425 430
 Gly His Val Phe Asp Ile Val Lys Ser Leu Gly Gly Thr Pro Asn Tyr
 435 440 445
 Val Asn Pro Pro Arg Arg Asp Val Val Arg Val Gly Gly Thr Gly Val
 450 455 460
 Val Leu Arg Phe Lys Thr Asp Asn Pro Gly Pro Trp Phe Val His Cys
 465 470 475 480
 His Ile Asp Trp His Leu Glu Ala Gly Leu Ala Leu Val Phe Ala Glu
 485 490 495
 Ala Pro Ser Gln Ile Arg Gln Gly Val Gln Ser Val Gln Pro Asn Asn
 500 505 510
 Ala Trp Asn Gln Leu Cys Pro Lys Tyr Ala Ala Leu Pro Pro Asp Leu
 515 520 525
 Gln

- (A) LENGTH: 599 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:

Met	Ala	Arg	Ser	Thr	Thr	Ser	Leu	Phe	Ala	Leu	Ser	Leu	Val	Ala	Ser
1				5					10					15	
Ala	Phe	Ala	Arg	Val	Val	Asp	Tyr	Gly	Phe	Asp	Val	Ala	Asn	Gly	Ala
		20						25					30		
Val	Ala	Pro	Asp	Gly	Val	Thr	Arg	Asn	Ala	Val	Leu	Val	Asn	Gly	Arg
		35					40					45			
Phe	Pro	Gly	Pro	Leu	Ile	Thr	Ala	Asn	Lys	Gly	Asp	Thr	Leu	Lys	Ile
	50					55					60				
Thr	Val	Arg	Asn	Lys	Leu	Ser	Asp	Pro	Thr	Met	Arg	Arg	Ser	Thr	Thr
65					70					75					80
Ile	His	Trp	His	Gly	Leu	Leu	Gln	His	Arg	Thr	Ala	Glu	Glu	Asp	Gly
				85					90					95	
Pro	Ala	Phe	Val	Thr	Gln	Cys	Pro	Ile	Pro	Pro	Gln	Glu	Ser	Tyr	Thr
			100					105					110		
Tyr	Thr	Met	Pro	Leu	Gly	Glu	Gln	Thr	Gly	Thr	Tyr	Trp	Tyr	His	Ser
		115					120					125			
His	Leu	Ser	Ser	Gln	Tyr	Val	Asp	Gly	Leu	Arg	Gly	Pro	Ile	Val	Ile
	130					135					140				
Tyr	Asp	Pro	His	Asp	Pro	Tyr	Arg	Asn	Tyr	Tyr	Asp	Val	Asp	Asp	Glu
145					150					155					160
Arg	Thr	Val	Phe	Thr	Leu	Ala	Asp	Trp	Tyr	His	Thr	Pro	Ser	Glu	Ala
				165					170					175	
Ile	Ile	Ala	Thr	His	Asp	Val	Leu	Lys	Thr	Ile	Pro	Asp	Ser	Gly	Thr
			180					185					190		
Ile	Asn	Gly	Lys	Gly	Lys	Tyr	Asp	Pro	Ala	Ser	Ala	Asn	Thr	Asn	Asn
		195					200					205			
Thr	Thr	Leu	Glu	Asn	Leu	Tyr	Thr	Leu	Lys	Val	Lys	Arg	Gly	Lys	Arg
	210					215					220				
Tyr	Arg	Leu	Arg	Ile	Ile	Asn	Ala	Ser	Ala	Ile	Ala	Ser	Phe	Arg	Phe
225					230					235					240
Gly	Val	Gln	Gly	His	Lys	Cys	Thr	Ile	Ile	Glu	Ala	Asp	Gly	Val	Leu
				245					250					255	
Thr	Lys	Pro	Ile	Glu	Val	Asp	Ala	Phe	Asp	Ile	Leu	Ala	Gly	Gln	Arg
			260					265					270		
Tyr	Ser	Cys	Ile	Leu	Lys	Ala	Asp	Gln	Asp	Pro	Asp	Ser	Tyr	Trp	Ile
		275					280					285			
Asn	Ala	Pro	Ile	Thr	Asn	Val	Leu	Asn	Thr	Asn	Val	Gln	Ala	Leu	Leu
	290					295					300				

Val Tyr Glu Asp Asp Lys Arg Pro Thr His Tyr Pro Trp Lys Pro Phe
 305 310 315 320
 Leu Thr Trp Lys Ile Ser Asn Glu Ile Ile Gln Tyr Trp Gln His Lys
 325 330 335
 His Gly Ser His Gly His Lys Gly Lys Gly His His His Lys Val Arg
 340 345 350
 Ala Ile Gly Gly Val Ser Gly Leu Ser Ser Arg Val Lys Ser Arg Ala
 355 360 365
 Ser Asp Leu Ser Lys Lys Ala Val Glu Leu Ala Ala Ala Leu Val Ala
 370 375 380
 Gly Glu Ala Glu Leu Asp Lys Arg Gln Asn Glu Asp Asn Ser Thr Ile
 385 390 395 400
 Val Leu Asp Glu Thr Lys Leu Ile Pro Leu Val Gln Pro Gly Ala Pro
 405 410 415
 Gly Gly Ser Arg Pro Ala Asp Val Val Val Pro Leu Asp Phe Gly Leu
 420 425 430
 Asn Phe Ala Asn Gly Leu Trp Thr Ile Asn Asn Val Ser Tyr Ser Pro
 435 440 445
 Pro Asp Val Pro Thr Leu Leu Lys Ile Leu Thr Asp Lys Asp Lys Val
 450 455 460
 Asp Ala Ser Asp Phe Thr Ala Asp Glu His Thr Tyr Ile Leu Pro Lys
 465 470 475 480
 Asn Gln Val Val Glu Leu His Ile Lys Gly Gln Ala Leu Gly Ile Val
 485 490 495
 His Pro Leu His Leu His Gly His Ala Phe Asp Val Val Gln Phe Gly
 500 505 510
 Asp Asn Ala Pro Asn Tyr Val Asn Pro Pro Arg Arg Asp Val Val Gly
 515 520 525
 Val Thr Asp Ala Gly Val Arg Ile Gln Phe Arg Thr Asp Asn Pro Gly
 530 535 540
 Pro Trp Phe Leu His Cys His Ile Asp Trp His Leu Glu Glu Gly Phe
 545 550 555 560
 Ala Met Val Phe Ala Glu Ala Pro Glu Asp Ile Lys Lys Gly Ser Gln
 565 570 575
 Ser Val Lys Pro Asp Gly Gln Trp Lys Lys Leu Cys Glu Lys Tyr Glu
 580 585 590
 Lys Leu Pro Glu Ala Leu Gln
 595

(2) INFORMATION FOR SEQ ID NO: 7:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 572 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

Met Ala Arg Thr Thr Phe Leu Val Ser Val Ser Leu Phe Val Ser Ala
 1 5 10 15
 Val Leu Ala Arg Thr Val Glu Tyr Asn Leu Lys Ile Ser Asn Gly Lys
 20 25 30
 Ile Ala Pro Asp Gly Val Glu Arg Asp Ala Thr Leu Val Asn Gly Gly
 35 40 45
 Tyr Pro Gly Pro Leu Ile Phe Ala Asn Lys Gly Asp Thr Leu Lys Val
 50 55 60
 Lys Val Gln Asn Lys Leu Thr Asn Pro Asp Met Tyr Arg Thr Thr Ser
 65 70 75 80
 Ile His Trp His Gly Leu Leu Gln His Arg Asn Ala Asp Asp Asp Gly
 85 90 95
 Pro Ala Phe Val Thr Gln Cys Pro Ile Val Pro Gln Ala Ser Tyr Thr
 100 105 110
 Tyr Thr Met Pro Leu Gly Asp Gln Thr Gly Thr Tyr Trp Tyr His Ser
 115 120 125
 His Leu Ser Ser Gln Tyr Val Asp Gly Leu Arg Gly Pro Leu Val Ile
 130 135 140
 Tyr Asp Pro Lys Asp Pro His Arg Arg Leu Tyr Asp Ile Asp Asp Glu
 145 150 155 160
 Lys Thr Val Leu Ile Ile Gly Asp Trp Tyr His Thr Ser Ser Lys Ala
 165 170 175
 Ile Leu Ala Thr Gly Asn Ile Thr Leu Gln Gln Pro Asp Ser Ala Thr
 180 185 190
 Ile Asn Gly Lys Gly Arg Phe Asp Pro Asp Asn Thr Pro Ala Asn Pro
 195 200 205
 Asn Thr Leu Tyr Thr Leu Lys Val Lys Arg Gly Lys Arg Tyr Arg Leu
 210 215 220
 Arg Val Ile Asn Ser Ser Ala Ile Ala Ser Phe Arg Met Ser Ile Gln
 225 230 235 240
 Gly His Lys Met Thr Val Ile Ala Ala Asp Gly Val Ser Thr Lys Pro
 245 250 255
 Tyr Gln Val Asp Ser Phe Asp Ile Leu Ala Gly Gln Arg Ile Asp Ala
 260 265 270
 Val Val Glu Ala Asn Gln Glu Pro Asp Thr Tyr Trp Ile Asn Ala Pro
 275 280 285
 Leu Thr Asn Val Ala Asn Lys Thr Ala Gln Ala Leu Leu Ile Tyr Glu
 290 295 300
 Asp Asp Arg Arg Pro Tyr His Pro Pro Lys Gly Pro Tyr Arg Lys Trp
 305 310 315 320
 Ser Val Ser Glu Ala Ile Ile Lys Tyr Trp Lys His Lys His Gly Arg
 325 330 335
 Gly Leu Leu Ser Gly His Gly Gly Leu Lys Ala Arg Met Met Glu Gly
 340 345 350

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Ser Leu His Leu His Gly Arg Arg Asp Ile Val Lys Arg Gln Asn Glu
 355 360 365
 Thr Thr Thr Val Val Met Asp Glu Thr Lys Leu Val Pro Leu Glu His
 370 375 380
 Pro Gly Ala Ala Cys Gly Ser Lys Pro Ala Asp Leu Val Ile Asp Leu
 385 390 395 400
 Thr Phe Gly Val Asn Phe Thr Thr Gly His Trp Met Ile Asn Gly Ile
 405 410 415
 Pro His Lys Ser Pro Asp Met Pro Thr Leu Leu Lys Ile Leu Thr Asp
 420 425 430
 Thr Asp Gly Val Thr Glu Ser Asp Phe Thr Gln Pro Glu His Thr Ile
 435 440 445
 Ile Leu Pro Lys Asn Lys Cys Val Glu Phe Asn Ile Lys Gly Asn Ser
 450 455 460
 Gly Leu Gly Ile Val His Pro Ile His Leu His Gly His Thr Phe Asp
 465 470 475 480
 Val Val Gln Phe Gly Asn Asn Pro Pro Asn Tyr Val Asn Pro Pro Arg
 485 490 495
 Arg Asp Val Val Gly Ala Thr Asp Glu Gly Val Arg Phe Gln Phe Lys
 500 505 510
 Thr Asp Asn Pro Gly Pro Trp Phe Leu His Cys His Ile Asp Trp His
 515 520 525
 Leu Glu Glu Gly Phe Ala Met Val Phe Ala Glu Ala Pro Glu Ala Ile
 530 535 540
 Lys Gly Gly Pro Lys Ser Val Pro Val Asp Arg Gln Trp Lys Asp Leu
 545 550 555 560
 Cys Arg Lys Tyr Gly Ser Leu Pro Ala Gly Phe Leu
 565 570

(2) INFORMATION FOR SEQ ID NO: 8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 575 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 8:

Met Ala Arg Thr Thr Phe Leu Val Ser Val Ser Leu Phe Val Ser Ala
 1 5 10 15
 Val Leu Ala Arg Thr Val Glu Tyr Gly Leu Lys Ile Ser Asp Gly Glu
 20 25 30
 Ile Ala Pro Asp Gly Val Lys Arg Asn Ala Thr Leu Val Asn Gly Gly
 35 40 45
 Tyr Pro Gly Pro Leu Ile Phe Ala Asn Lys Gly Asp Thr Leu Lys Val
 50 55 60

Lys Val Gln Asn Lys Leu Thr Asn Pro Glu Met Tyr Arg Thr Thr Ser
 65 70 75 80
 Ile His Trp His Gly Leu Leu Gln His Arg Asn Ala Asp Asp Asp Gly
 85 90 95
 Pro Ser Phe Val Thr Gln Cys Pro Ile Val Pro Arg Glu Ser Tyr Thr
 100 105 110
 Tyr Thr Ile Pro Leu Asp Asp Gln Thr Gly Thr Tyr Trp Tyr His Ser
 115 120 125
 His Leu Ser Ser Gln Tyr Val Asp Gly Leu Arg Gly Pro Leu Val Ile
 130 135 140
 Tyr Pro Lys Asp Pro His Arg Arg Leu Tyr Asp Val Asp Asp Glu Lys
 145 150 155 160
 Thr Val Leu Ile Ile Gly Asp Trp Tyr His Glu Ser Ser Lys Ala Ile
 165 170 175
 Leu Ala Ser Gly Asn Ile Thr Arg Gln Arg Pro Val Ser Ala Thr Ile
 180 185 190
 Asn Gly Lys Gly Arg Phe Asp Pro Asp Asn Thr Pro Ala Asn Pro Asp
 195 200 205
 Thr Leu Tyr Thr Leu Lys Val Lys Arg Gly Lys Arg Tyr Arg Leu Arg
 210 215 220
 Val Ile Asn Ser Ser Glu Ile Ala Ser Phe Arg Phe Ser Val Glu Gly
 225 230 235 240
 His Lys Val Thr Val Ile Ala Ala Asp Gly Val Ser Thr Lys Pro Tyr
 245 250 255
 Gln Val Asp Ala Phe Asp Ile Leu Ala Gly Gln Arg Ile Asp Cys Val
 260 265 270
 Val Glu Ala Asn Gln Glu Pro Asp Thr Tyr Trp Ile Asn Ala Pro Leu
 275 280 285
 Thr Asn Val Pro Asn Lys Thr Ala Gln Ala Leu Leu Val Tyr Glu Glu
 290 295 300
 Asp Arg Arg Pro Tyr His Pro Pro Lys Gly Pro Tyr Arg Lys Trp Ser
 305 310 315 320
 Val Ser Glu Ala Ile Ile Lys Tyr Trp Asn His Lys His Lys His Gly
 325 330 335
 Arg Gly Leu Leu Ser Gly His Gly Gly Leu Lys Ala Arg Met Ile Glu
 340 345 350
 Gly Ser His His Leu His Ser Arg Ser Val Val Lys Arg Gln Asn Glu
 355 360 365
 Thr Thr Thr Val Val Met Asp Glu Ser Lys Leu Val Pro Leu Glu Tyr
 370 375 380
 Pro Gly Ala Ala Cys Gly Ser Lys Pro Ala Asp Leu Val Leu Asp Leu
 385 390 395 400
 Thr Phe Gly Leu Asn Phe Ala Thr Gly His Trp Met Ile Asn Gly Ile
 405 410 415
 Pro Tyr Glu Ser Pro Lys Ile Pro Thr Leu Leu Lys Ile Leu Thr Asp

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420	425	430
Glu Asp Gly Val Thr Glu Ser Asp Phe Thr Lys Glu Glu His Thr Val		
435	440	445
Ile Leu Pro Lys Asn Lys Cys Ile Glu Phe Asn Ile Lys Gly Asn Ser		
450	455	460
Gly Ile Pro Ile Thr His Pro Val His Leu His Gly His Thr Trp Asp		
465	470	475
Val Val Gln Phe Gly Asn Asn Pro Pro Asn Tyr Val Asn Pro Pro Arg		
485	490	495
Arg Asp Val Val Gly Ser Thr Asp Ala Gly Val Arg Ile Gln Phe Lys		
500	505	510
Thr Asp Asn Pro Gly Pro Trp Phe Leu His Cys His Ile Asp Trp His		
515	520	525
Leu Glu Glu Gly Phe Ala Met Val Phe Ala Glu Ala Pro Glu Ala Val		
530	535	540
Lys Gly Gly Pro Lys Ser Val Ala Val Asp Ser Gln Trp Glu Gly Leu		
545	550	555
Cys Gly Lys Tyr Asp Asn Trp Leu Lys Ser Asn Pro Gly Gln Leu		
565	570	575

(2) INFORMATION FOR SEQ ID NO: 9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 616 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 9:

Met Lys Arg Phe Phe Ile Asn Ser Leu Leu Leu Leu Ala Gly Leu Leu	
1	15
Asn Ser Gly Ala Leu Ala Ala Pro Ser Thr His Pro Arg Ser Asn Pro	
20	30
Asp Ile Leu Leu Glu Arg Asp Asp His Ser Leu Thr Ser Arg Gln Gly	
35	45
Ser Cys His Ser Pro Ser Asn Arg Ala Cys Trp Cys Ser Gly Phe Asp	
50	60
Ile Asn Thr Asp Tyr Glu Thr Lys Thr Pro Asn Thr Gly Val Val Arg	
65	80
Arg Tyr Thr Phe Asp Ile Thr Glu Val Asp Asn Arg Pro Gly Pro Asp	
85	95
Gly Val Ile Lys Glu Lys Leu Met Leu Ile Asn Asp Lys Leu Leu Gly	
100	110
Pro Thr Val Phe Ala Asn Trp Gly Asp Thr Ile Glu Val Thr Val Asn	
115	125

Asn His Leu Arg Thr Asn Gly Thr Ser Ile His Trp His Gly Leu His
 130 135 140
 Gln Lys Gly Thr Asn Tyr His Asp Gly Ala Asn Gly Val Thr Glu Cys
 145 150 155 160
 Pro Ile Pro Pro Gly Gly Ser Arg Val Tyr Ser Phe Arg Ala Arg Gln
 165 170 175
 Tyr Gly Thr Ser Trp Tyr His Ser His Phe Ser Ala Gln Tyr Gly Asn
 180 185 190
 Gly Val Ser Gly Ala Ile Gln Ile Asn Gly Pro Ala Ser Leu Pro Tyr
 195 200 205
 Asp Ile Asp Leu Gly Val Leu Pro Leu Xaa Asp Trp Tyr Tyr Lys Ser
 210 215 220
 Ala Asp Gln Leu Val Ile Glu Thr Leu Xaa Lys Gly Asn Ala Pro Phe
 225 230 235 240
 Ser Asp Asn Val Leu Ile Asn Gly Thr Ala Lys His Pro Thr Thr Gly
 245 250 255
 Glu Gly Glu Tyr Ala Ile Val Lys Leu Thr Pro Asp Lys Arg His Arg
 260 265 270
 Leu Arg Leu Ile Asn Met Ser Val Glu Asn His Phe Gln Val Ser Leu
 275 280 285
 Ala Lys His Thr Met Thr Val Ile Ala Ala Asp Met Val Pro Val Asn
 290 295 300
 Ala Met Thr Val Asp Ser Leu Phe Met Ala Val Gly Gln Arg Tyr Asp
 305 310 315 320
 Val Thr Ile Asp Ala Ser Gln Ala Val Gly Asn Tyr Trp Phe Asn Ile
 325 330 335
 Thr Phe Gly Gly Gln Gln Lys Cys Gly Phe Ser His Asn Pro Ala Pro
 340 345 350
 Ala Ala Ile Phe Arg Tyr Glu Gly Ala Pro Asp Ala Leu Pro Thr Asp
 355 360 365
 Pro Gly Ala Ala Pro Lys Asp His Gln Cys Leu Asp Thr Leu Asp Leu
 370 375 380
 Ser Pro Val Val Gln Lys Asn Val Pro Val Asp Gly Phe Val Lys Glu
 385 390 395 400
 Pro Gly Asn Thr Leu Pro Val Thr Leu His Val Asp Gln Ala Ala Ala
 405 410 415
 Pro His Val Phe Thr Trp Lys Ile Asn Gly Ser Ala Ala Asp Val Asp
 420 425 430
 Trp Asp Arg Pro Val Leu Glu Tyr Val Met Asn Asn Asp Leu Ser Ser
 435 440 445
 Ile Pro Val Lys Asn Asn Ile Val Arg Val Asp Gly Val Asn Glu Trp
 450 455 460
 Thr Tyr Trp Leu Val Glu Asn Asp Pro Glu Gly Arg Leu Ser Leu Pro
 465 470 475 480
 His Pro Met His Leu His Gly His Asp Phe Phe Val Leu Gly Arg Ser

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				485						490						495
Pro	Asp	Val	Ser	Pro	Asp	Ser	Glu	Thr	Arg	Phe	Val	Phe	Asp	Pro	Ala	
			500					505					510			
Val	Asp	Leu	Pro	Arg	Leu	Arg	Gly	His	Asn	Pro	Val	Arg	Arg	Asp	Val	
		515					520					525				
Thr	Met	Leu	Pro	Ala	Arg	Gly	Trp	Leu	Leu	Leu	Ala	Phe	Arg	Thr	Asp	
	530					535					540					
Asn	Pro	Gly	Ala	Trp	Leu	Phe	His	Cys	His	Ile	Ala	Xaa	His	Val	Ser	
545					550					555					560	
Gly	Gly	Leu	Ser	Val	Asp	Phe	Leu	Glu	Arg	Pro	Asp	Glu	Leu	Arg	Gly	
				565					570					575		
Gln	Leu	Thr	Gly	Glu	Ser	Lys	Ala	Glu	Leu	Glu	Arg	Val	Cys	Arg	Glu	
			580					585					590			
Trp	Lys	Asp	Trp	Glu	Ala	Lys	Ser	Pro	His	Gly	Lys	Ile	Asp	Ser	Gly	
		595					600					605				
Leu	Lys	Gln	Arg	Arg	Trp	Asp	Ala									
	610					615										

(2) INFORMATION FOR SEQ ID NO: 10:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 573 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 10:

Gln	Gln	Ser	Cys	Asn	Thr	Pro	Ser	Asn	Arg	Ala	Cys	Trp	Thr	Asp	Gly
1				5					10					15	
Tyr	Asp	Ile	Asn	Thr	Asp	Tyr	Glu	Val	Asp	Ser	Pro	Asp	Thr	Gly	Val
			20					25					30		
Val	Arg	Pro	Tyr	Thr	Leu	Thr	Leu	Thr	Glu	Val	Asp	Asn	Trp	Thr	Gly
		35					40					45			
Pro	Asp	Gly	Val	Val	Lys	Glu	Lys	Val	Met	Leu	Val	Asn	Asn	Ser	Ile
	50					55					60				
Ile	Gly	Pro	Thr	Ile	Phe	Ala	Asp	Trp	Gly	Asp	Thr	Ile	Gln	Val	Thr
65				70					75					80	
Val	Ile	Asn	Asn	Leu	Glu	Thr	Asn	Gly	Thr	Ser	Ile	His	Trp	His	Gly
			85						90				95		
Leu	His	Gln	Lys	Gly	Thr	Asn	Leu	His	Asp	Gly	Ala	Asn	Gly	Ile	Thr
			100				105						110		
Glu	Cys	Pro	Ile	Pro	Pro	Lys	Gly	Gly	Arg	Lys	Val	Tyr	Arg	Phe	Lys
		115					120					125			
Ala	Gln	Gln	Tyr	Gly	Thr	Ser	Trp	Tyr	His	Ser	His	Phe	Ser	Ala	Gln
	130					135					140				
Tyr	Gly	Asn	Gly	Val	Val	Gly	Ala	Ile	Gln	Ile	Asn	Gly	Pro	Ala	Ser

145		150		155		160
Leu Pro Tyr Asp Thr	Asp Leu Gly Val Phe Pro Ile Ser Asp Tyr Tyr					
	165			170		175
Tyr Ser Ser Ala Asp Glu Leu Val Glu Leu Thr Lys Asn Ser Gly Ala						
	180		185			190
Pro Phe Ser Asp Asn Val Leu Phe Asn Gly Thr Ala Lys His Pro Glu						
	195	200			205	
Thr Gly Glu Gly Glu Tyr Ala Asn Val Thr Leu Thr Pro Gly Arg Arg						
	210	215		220		
His Arg Leu Arg Leu Ile Asn Thr Ser Val Glu Asn His Phe Gln Val						
	225	230		235		240
Ser Leu Val Asn His Thr Met Cys Ile Ile Ala Ala Asp Met Val Pro						
		245	250			255
Val Asn Ala Met Thr Val Asp Ser Leu Phe Leu Gly Val Gly Gln Arg						
	260		265			270
Tyr Asp Val Val Ile Glu Ala Asn Arg Thr Pro Gly Asn Tyr Trp Phe						
	275		280		285	
Asn Val Thr Phe Gly Gly Gly Leu Leu Cys Gly Gly Ser Arg Asn Pro						
	290		295		300	
Tyr Pro Ala Ala Ile Phe His Tyr Ala Gly Ala Pro Gly Gly Pro Pro						
	305		310		315	320
Thr Asp Glu Gly Lys Ala Pro Val Asp His Asn Cys Leu Asp Leu Pro						
		325		330		335
Asn Leu Lys Pro Val Val Ala Arg Asp Val Pro Leu Ser Gly Phe Ala						
		340		345		350
Lys Arg Ala Asp Asn Thr Leu Asp Val Thr Leu Asp Thr Thr Gly Thr						
	355		360			365
Pro Leu Phe Val Trp Lys Val Asn Gly Ser Ala Ile Asn Ile Asp Trp						
	370		375		380	
Gly Arg Ala Val Val Asp Tyr Val Leu Thr Gln Asn Thr Ser Phe Pro						
	385		390		395	400
Pro Gly Tyr Asn Ile Val Glu Val Asn Gly Ala Asp Gln Trp Ser Tyr						
		405		410		415
Trp Leu Ile Glu Asn Asp Pro Gly Ala Pro Phe Thr Leu Pro His Pro						
		420		425		430
Met His Leu His Gly His Asp Phe Tyr Val Leu Gly Arg Ser Pro Asp						
	435		440		445	
Glu Ser Pro Ala Ser Asn Glu Arg His Val Phe Asp Pro Ala Arg Asp						
	450		455		460	
Ala Gly Leu Leu Ser Gly Ala Asn Pro Val Arg Arg Asp Val Ser Met						
	465		470		475	480
Leu Pro Ala Phe Gly Trp Val Val Leu Ser Phe Arg Ala Asp Asn Pro						
		485		490		495
Gly Ala Trp Leu Phe His Cys His Ile Ala Trp His Val Ser Gly Gly						
	500		505		510	

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Leu Gly Val Val Tyr Leu Glu Arg Ala Asp Asp Leu Arg Gly Ala Val
 515 520 525

Ser Asp Ala Asp Ala Asp Asp Leu Asp Arg Leu Cys Ala Asp Trp Arg
 530 535 540

Arg Tyr Trp Pro Thr Asn Pro Tyr Pro Lys Ser Asp Ser Gly Leu Lys
 545 550 555 560

His Arg Trp Val Glu Glu Gly Glu Trp Leu Val Lys Ala
 565 570

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